

## MATLAB para Aplicaciones Financieras.

### Curso presencial

#### Objetivo del curso:

Working with the MATLAB® user interface, importing data from spreadsheets and other sources, representing financial data in MATLAB®, working with dates and times, visualizing time and price series characteristics using 2-D and 3-D plots, filtering large datasets based on logical criteria, automating tasks using code files, algorithm development using programming constructs, performing data analysis, modeling, and simulation, generating reports and exporting data to file..

#### Requisito(s):

Undergraduate-level mathematics and experience with basic computer operations.

#### Descripción del curso:

This course provides a comprehensive introduction to the MATLAB® technical computing environment for financial professionals.

Imparte: Emmanuel Olivar  
Ingeniero en Sistemas Electrónicos Industriales



Emmanuel Olivar Domínguez, egresado de la Universidad Autónoma de la Ciudad de México (UACM), cuenta con amplia experiencia en el mantenimiento preventivo y correctivo de equipo electrónico industrial y comercial, además de utilizar tecnología Mathworks (MATLAB y Simulink) por más de cinco años. Se especializa en las áreas de control e instrumentación con la finalidad de apoyar en la solución de las problemáticas que se puedan presentar en éstas, además de utilizar diversas herramientas con el fin de desarrollar controladores aplicados a la industria.

Actualmente ocupa el cargo de Ingeniero de Aplicación MATLAB en MultiON Consulting S.A. de C.V. en donde se dedica a la resolución de problemas de índole computacional que enfrentan organizaciones tanto públicas como privadas.

## Temario

*\*El manual del curso se encuentra en inglés.*

1. Introduction.
  - 1.1 MathWorks® at a Glance.
  - 1.2 MathWorks® Product Overview.
  - 1.3 Diverse Users.
  - 1.4 Computer Setup.
  - 1.5 What Can You Do with MATLAB®?
  - 1.6 Course Example.
  - 1.7 Strategy: The Market.
  - 1.8 Strategy: Stock Performance.
  - 1.9 Create a Backtest.
  - 1.10 Analyze and Report Backtest Results.
  - 1.11 Rebalance Portfolio.
  
2. Working with the MATLAB® User Interface.
  - 2.1 The MATLAB® Desktop.
  - 2.2 Customizing the Desktop.
  - 2.3 Interactive Importing.
  - 2.4 Variables in the Base Workspace.
  - 2.5 The Variable Editor.
  - 2.6 New Variables.
  - 2.7 Saving and Loading Variables.
  - 2.8 Plotting the Data.
  - 2.9 Customizing the Plot.
  - 2.10 Plot Tools.
  - 2.11 Adding Data to the Plot.
  - 2.12 Formatting the Plot.
  - 2.13 Basic Fitting.
  - 2.14 Exporting to Another Application.
  - 2.15 Shortcuts
  
3. Variables and Commands.
  - 3.1 Getting Data into MATLAB®.
  - 3.2 Entering Commands. 3.3.
  - 3.3 Storing Data in Variables.
  - 3.4 Creating Characters and Strings.
  - 3.5 Using MATLAB® Functions.
  - 3.6 Importing Spreadsheets Interactively.
  - 3.7 Importing Spreadsheets Programmatically.

- 3.8 Vectors, Matrices, and Arrays.
  - 3.9 Creating Vectors and Matrices.
  - 3.10 Creating Vectors.
  - 3.11 Determining Size.
  - 3.12 Creating Matrices.
  - 3.13 Concatenating Arrays.
  - 3.14 Accessing Data in Arrays.
  - 3.15 Accessing Multiple Elements.
  - 3.16 Changing Values in an Array.
  - 3.17 Plotting Vectors.
  - 3.18 Plot Options.
  - 3.19 Annotating Plots.
  - 3.20 Creating Arrays of Strings.
  - 3.21 Saving and Loading Variables.
4. Automating Commands with Scripts.
- 4.1 The Command History.
  - 4.2 The MATLAB® Editor.
  - 4.3 Running a Script.
  - 4.4 Comments and Documentation.
  - 4.5 Code Sections.
  - 4.6 Publishing Code.
5. Visualizing Results.
- 5.1 Visualization Functions.
  - 5.2 Basic Plotting.
  - 5.3 Customizing Plots.
  - 5.4 Customizing Plot Annotations.
  - 5.5 Axis Control.
6. Dates and Times.
- 6.1 Dates and Durations.
  - 6.2 Creating Datetime Variables.
  - 6.3 Converting Strings to Datetime.
  - 6.4 Retrieving Data from a Datafeed.
  - 6.5 Converting Datafeed Dates to Datetime.
  - 6.6 Joining Data by Dates.
  - 6.7 Displaying and Plotting Dates.
  - 6.8 Extracting Date Components.
  - 6.9 Extracting Duration Components.
  - 6.10 Date Arithmetic.
  - 6.11 Converting Datetime Variables.

- 6.12 Making Other Kinds of Plots with Dates.
  
- 7. Working with Tabular Data.
  - 7.1 Storing data as a table.
  - 7.2 Extracting Data from Tables.
  - 7.3 Modifying Tables.
  - 7.4 Indexing into Tables.
  - 7.5 Converting Between Tables and Arrays.
  - 7.6 Function Handles.
  - 7.7 Anonymous Functions.
  - 7.8 Applying Functions to Table Variables.
  - 7.9 Exporting Tables.
  
- 8. Conditional Data Selection.
  - 8.1 Logical Operations and Variables.
  - 8.2 Combining Logical Conditions.
  - 8.3 Logic with Dates.
  - 8.4 Logical Indexing.
  - 8.5 Categories.
  - 8.6 Finding Indices.
  - 8.7 Counting Elements.
  
- 9. Programming Flow Control.
  - 9.1 User Interaction.
  - 9.2 Flow Control.
  - 9.3 While-Loops.
  - 9.4 For-Loops.
  
- 10. Working with Missing Data.
  - 10.1 Avoiding NaNs in Calculations.
  - 10.2 Locating Missing Values.
  - 10.3 Removing Missing Values.
  - 10.4 Replacing Missing Values in Matrices.
  - 10.5 Replacing Missing Values in Tables.
  
- 11. Customizing Graphics.
  - 11.1 Graphics Structure.
  - 11.2 Multiple Figures and Axes.
  - 11.3 Creating and Accessing Graphics Objects.
  - 11.4 Properties of Graphics Objects.
  - 11.5 Displaying a Table Graphically.
  - 11.6 Parents and Children.

## 12. Fitting Models to Empirical Data.

- 12.1 Polynomial Fitting.
- 12.2 Creating Regression Models.
- 12.3 Evaluating Goodness of Fit.
- 12.4 Fitting Distributions.
- 12.5 Parametric Fitting.
- 12.6 Generating Random Numbers.

## 13. Writing Functions

- 13.1 Creating a Function.
- 13.2 Calling a Function.
- 13.3 Workspaces.
- 13.4 Calling Precedence.
- 13.5 The MATLAB® Path
- 13.6 Debugging.
- 13.7 Using Breakpoints.
- 13.8 Examining Values.
- 13.9 Ending Debugging.
- 13.10 MATLAB® Data Types.
- 13.11 Combining Heterogeneous Data with Structures.



MultiON es una empresa 100% mexicana fundada en 1989 por el ingeniero y maestro en administración Joaquín Antonio Maury González, durante sus estudios de doctorado. MultiON ES LÍDER EN México y Latinoamérica en la comercialización, soporte y capacitación de cómputo científico y técnico: software y hardware para la ciencia, la educación, la industria y los servicios.

## Joel Cervantes

Asesor Comercial LATAM

MultiON Consulting, S.A. de C.V.

Cómputo Científico y Técnico: *software y hardware especializado.*

Tel: +52 (55) 5559-4050 Ext. 119 | [cursos@multion.com](mailto:cursos@multion.com)

[www.multion.com](http://www.multion.com)